

This lesson is part of a larger, comprehensive school garden guide called **Minnesota School Gardens: A Guide to Gardening and Plant Science** developed by Minnesota Agriculture in the Classroom in 2013. The entire guide is available at www.mda.state.mn.us/maitc.



Grade

Elementary K-5

Materials/Preparation

- ☐ Teacher Material A – What Are We Eating? – one per teacher
- ☐ Handout A – What Do We Eat? – one per student
- ☐ Assessment A – What Are We Eating? – one per student
- ☐ A variety of plants from the garden or plant part models
- ☐ Materials to make a Venn Diagram (markers and large sheets of paper or bulky yarn to make on the classroom floor)
- ☐ Material to make fruit and vegetable labels and a plant parts chart
- ☐ Writing instruments

Fun Fact

The flavor of a strawberry is influenced by weather, the variety, and stage of ripeness when harvested.



What Are We Eating?

Minnesota K-12 Academic Standards

Science	0.4.1.1 2.4.1.1 3.4.1.1 5.4.1.1	Living things are diverse with many different observable characteristics.
Health	3.7.2	The student will demonstrate strategies to improve or maintain personal health.
Health	5.7.2	The student will describe responsible health behaviors.

Summary/Overview

A significant reason to engage in gardening in schools is to teach students, and allow them to discover for themselves, how plants grow and what parts of plants we eat. That is the purpose of this activity.

Garden Connection

Students examine garden plants and produce and identify roots, stems, leaves, and flowers.

Background Information

Surprisingly, some students actually believe that food comes from the grocery store ... as if machinery in the back of the store is manufacturing the foods they eat every day. Of course, many of the foods consumed today are processed into forms unrecognizable from their plant or animal origins. While most adults recognize that foods are grown on farms from plants or raised as domesticated animals, even they would be at a loss to answer the questions posed in this lesson.

Is it a root? Is it a stem? Is it a leaf? Is it a fruit? Is it actually a vegetable? We often informally classify plant products by how they are consumed. If it is served with the main entrée in a meal, we may consider it a vegetable. If it is sweet or served as dessert, we may consider it a fruit. Actually, there is a scientific botanical definition of fruits. In laymen's terms, if it has a seed or is a seed, it is botanically the fruit of the plant. So, grains are plant fruits. Tomatoes are plant fruits. Cucumbers, squash, and pumpkins are all plant fruits.

So, what are vegetables? Vegetables are the vegetative part of the plant and the reproductive part of the plant before they bloom, set fruit, and form seeds.

Vegetables are:

Leaves	Lettuce, Cabbage, Spinach, Bay Leaves, Oregano, Sage, Parsley Flakes, Basil, Rosemary, Thyme, Tea, Dill Weed, Cilantro, Mints
Modified Leaves	Onions, Celery, Brussels Sprouts, Garlic
Flowers	Broccoli, Cauliflower, Artichoke, Cloves, Saffron
Stems	Cinnamon, Asparagus
Modified Stems	Potatoes, Turnips, Ginger
Roots	Carrots, Beets, Parsnips, Sweet Potatoes, Radishes, Turmeric

Botanically, all of these are fruits:

Often Called Vegetables	Tomatoes, Cucumbers, Peppers, Squash, Pumpkins, Green Beans, Sweet Corn, Peas, Snow Peas
Fruits	Apples, Cherries, Peaches, Plums, Watermelons, Cantaloupes, Bananas, Oranges, Lemons, Limes, Mangoes, Strawberries, Blueberries, Raspberries, Gooseberries, Grapes, Currents, Dates, Figs
Nuts	Almonds, Black Walnuts, Brazil Nuts, Cashews, Coconuts, Hazel Nuts, Hickory Nuts, Peanuts, Pecans, Walnuts
Grains	Corn, Wheat, Oats, Sorghum, Barley
Spices	Allspice, Chili Powder, Caraway, Cardamom, Coriander, Dill Seed, Mace, Mustard, Nutmeg, Paprika, Pepper, Vanilla

Of course, it isn't always so simple. In some plants both the fruit and vegetative portions are used as food. This is true with dill. The leaves are used as dill weed, and the immature flower heads are used as a flavoring in dill pickles; these are vegetative. The dill seed (fruit) are also used in making dill pickles and as a spice. The leaves of the cilantro plant are used in Mexican cooking as an herb (vegetative), but when the plant develops seed (fruit), it is used as a spice and known as coriander. And politics or the law sometimes intervenes.

In 1883, the Supreme Court ruled that tomatoes should be considered a vegetable for tax purposes. The U.S. Congress passed the Tariff Act of 1883 that imposed a 10-percent tariff on all imported vegetables. The tax collector in New York Harbor was collecting tax on tomatoes as a vegetable. Fruit importers, the Nix brothers, sued to retrieve back taxes, claiming that tomatoes were actually fruit and therefore should not be taxed. The court denied the claim and tomatoes were legally determined to be vegetables regardless of science. Tax is still paid today on imported tomatoes. This lesson is straightforward in most applications and only explores the more confusing aspects of fruits vs. vegetables as an enhancement.

Objectives

- Explain plant anatomy and foods associated with different plant parts.
- Identify if food is actually a fruit or vegetable and which parts of plants are consumed as food.

Procedure

Interest Approach

Find out what your students already know about where their foods come from by asking questions such as: "Which foods that you eat come from plants? Which foods come from animals?" Have students list favorite foods they believe come from plants and explore the ingredients. Older students can do this by reading ingredient labels, researching online or in the library. Review the parts of the plant, the process of plant growth, and reproduction using the plant diagram included. After the food sources are identified, determine the parts of the plant that are used to make up that food. Generalities are fine.

Summary of Content and Teaching Strategies

Fruit or Vegetable? Activity

As a class, make a list of as many fruits and vegetables as students can think of. Post the list where students can see it. Make labels for each fruit and vegetable with letters large enough to be seen from a distance. (Alternative: Have students find pictures of each fruit or vegetable from seed catalogs, magazines, grocery store fliers, or online.) Explain the difference between a fruit and vegetable, as described above.

On a bulletin board with paper and marker, or on the floor using heavy yarn, make two circles. Label the circles *Fruit* and *Vegetable*.

Select the first item listed and ask: "Do you think this is a fruit or a vegetable?" Place either the picture or word in the portion of the circle labeled appropriately. Continue placing all fruits and vegetables in one category or the other.

What part of the plant?

Create a chart in a visible location with the headings: Leaf/Leaves, Flowers, Stems, Roots (for younger students) or Leaf/Leaves, Modified Leaves, Flowers, Stems, Modified Stems, Roots (for older students). Provide copies of Handout A for student use either to take notes or with a group activity. Also display Teacher Material A.

Using only the plant foods identified in the previous activity as true vegetables, have the students categorize each vegetable on the list into one of these categories. This may be done in small groups or as a class.

Review/Summary

Have older students either dissect modified leaves and stems or research information about them on the Internet. Identifying onions as modified leaves is easily seen with scallions or green onions. Celery, when stripped off the bunch, reveals the stem at the center of the plant. The celery stalk connects the leaf to the stem.

Modifications/Extensions

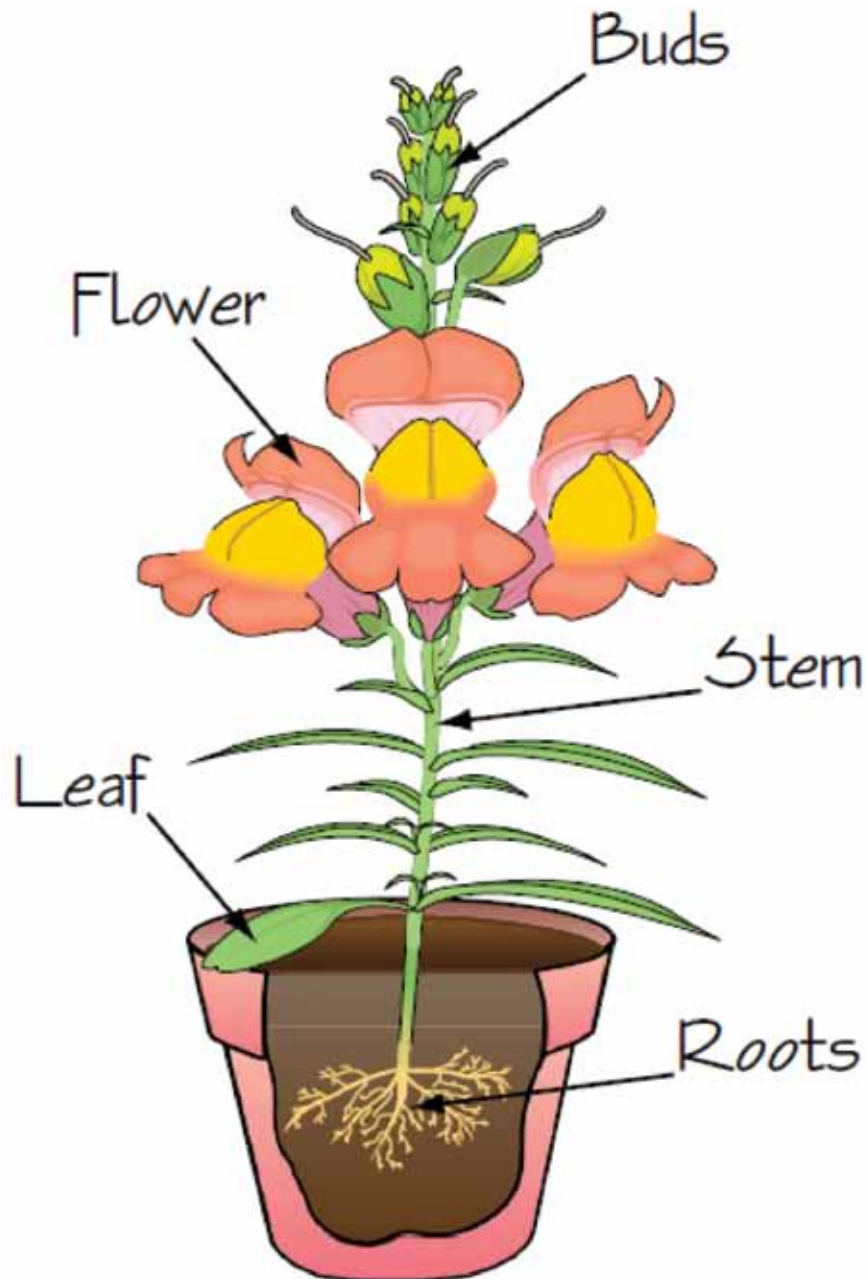
See the lesson specifically developed for teaching biology to middle school and high school students "What Parts of a Plant Do We Eat?" at: http://serendip.brynmawr.edu/sci_edu/waldron/#planteaters

Have the students select an herb or spice and research its history, origin, and uses. Use the information to write a report, create a PowerPoint presentation, or poster project.

Sources/Credits

The above lesson is provided courtesy of Florida Agriculture in the Classroom, Inc. from its *Gardening for Grades* school garden curriculum.

What Are We Eating?



Source: The above image is provided courtesy of Florida Agriculture in the Classroom, Inc from its Gardening for Grades school garden curriculum.

Name _____



What Do We Eat?

Leaf/Leaves	Flowers	Stems	Roots

Name _____



What Are We Eating?

1. What is the difference between a fruit and a vegetable?

2. Which of these are leaves?

Lettuce, cabbage, spinach

Brussels sprouts, broccoli, asparagus

Lettuce, rhubarb, potatoes

3. List two vegetables that are roots.

4. List three fruits that are commonly known as fruits and scientifically also fruits.
